CLAIMS

1. A device for balancing the pressures of first and second fluids contained respectively within first and second circuits or receptacles (36a, 36b), the device being characterized by the facts that it comprises:

first and second valves (35a, 35b) respectively comprising first and second valve bodies (12a, 12c, 12b, 12d) respectively defining first and second chambers (13a, 13b) communicating via first and second admission orifices (19a, 19b) respectively with the first and second circuits or receptacles respectively containing the first and second fluids, and communicating via respective exhaust orifices (18a, 18b) with respective exhaust means (38a, 38b) for the first and second fluids, at least one first valve member (20a) and at least one second valve member (20b) mounted to move respectively in the first and second chambers (13a, 13b) along an axial actuation direction (15) between a position for closing and a position for opening the exhaust orifices of the first and second chambers (13a, 13b) respectively, a first piston (22a, 24a) and a second piston (22b, 24b) each constituted by a rigid plate (22a, 22b) secured respectively to the first or to the second valve member (20a, 20b), and a flexible metal wall of a bellows (24a, 24b) secured in leaktight manner to the rigid plate of the respective piston (22a, 22b) and to an element (25a, 25b) of the first and the second valve bodies (12a, 12c, 12b, 12d) respectively, so as to constitute a closed chamber having a wall that is deformable in the actuation direction (15), and first and second resilient return means (32a, 32b) for returning the first and second valve members (20a, 20b) respectively into the closed position; and

that the first closed chamber of the first piston (22a, 24c) of the first valve (35a) is in communication with the chamber (13b) of the second valve (35b), and the closed chamber of the second piston (22b, 24b) of the

second valve (35b) is in communication with the chamber (13a) of the first valve (35a).

2. A device according to claim 1, characterized by the fact that the body (12a, 12c) of the first valve and the body (12b, 12d) of the second valve are interconnected and in axial alignment along a common actuation direction (15) of the first and second valves so as to constitute a body (12) of the balancer device, the chamber (13a) of the first valve and the chamber (13b) of the second valve being separated from each other by a wall (12e) extending transversely relative to the actuation direction (15) of the body (12) of the balancer device, said wall having fixed thereon, on a first side inside the chamber (13a) of the first valve, the metal wall (24a) of the bellows of the first piston (22a, 24a), and on a second side along the actuation direction (15) inside the chamber (13b) of the second valve, the metal wall (24b) of the bellows of the second piston (22b, 24b), the separation wall (12e) of the body (12) of the balancer device having passing therethrough a first channel (27a) for putting the first closed chamber of the first piston (22a, 24a) into communication with the chamber (13b) of the second valve, and a second channel (27b) putting the closed chamber of the second piston (22b, 24b) into communication with the chamber (13a) of the first valve.

3. A balancer device according to claim 1 or claim 2, characterized by the fact that the body (12a, 12c) of the first valve and the body (12b, 12d) of the second valve are built up of two assembled-together portions respectively defining a first portion (13'a, 13'b) of the valve chamber in which the admission opening (19a, 19b) and the exhaust opening (18a, 18b) are provided, and a second portion (13"a, 13"b) in which there are disposed the first and second pistons (22a, 24a, 22b, 24b) respectively, the first and second portions of the

chambers (13a, 13b) of the first and second valves being separated by respective walls of the body (12a, 12c, 12b, 12d) of the valve having respective openings formed therethrough on the axial actuation direction (15) and in which there are disposed respective guide bearings (14a, 14b) for the corresponding valve members (20a, 20b), each of which comprises a rod mounted on the axial actuation direction (15) with one axial end secured to the corresponding piston (22a, 24a, 22b, 24b) and with the opposite end, inside the first portion (13'a, 13'b) of the valve chamber, carrying a shutter member (21a, 21b).

4. A balancer device according to any one of claims 1 to 3, characterized by the fact that the first valve member (20a) of the first valve and the second valve member (20b) of the second valve include respective shutter assemblies (21a, 21b) for shutting the exhaust openings (18a, 18b), each of said assemblies including a pilot valve shutter member (21'a, 21'b) secured to one end of a rod of the valve member (20a, 20b) and a main shutter member (21"a, 21"b) having a surface for bearing against a seat of the exhaust opening (18a, 18b) and a central cavity in which the shutter member of the pilot valve (21'a, 21'b) is engaged with freedom to move along the direction of the actuation axis (15) of the valve, the pilot valve shutter member communicating with the outside of the main valve (21"a) via a channel (31a, 31b) that the pilot valve shutter member (21'a, 21'b) is capable of closing.

5. A device according to any one of claims 1 to 4, characterized by the fact that the first and second resilient return means (32a, 32b) of the first and second valve members (20a, 20b) are constituted by helical springs interposed between respective thrust surfaces of the first and second valve members (20a, 20b) and thrust

surfaces of a valve body (12) corresponding to the balancer device.

6. A device according to claim 5, characterized by the fact that the helical spring (32a, 32b) has at least one of its ends thrusting against a thrust plate (33a, 33b) of position that is adjustable along the actuation direction (15) of the valve of the balancer device.

7. The use of a balancer device according to any one of claims 1 to 6, for adjusting the pressures of two fluids to values that are substantially equal in respective feed circuits (36a, 36b) for first and second heat exchanger portions of a heat exchanger (37).

8. A use according to claim 7, characterized by the fact that the heat exchanger (37) is a plate heat exchanger.

9. A use according to claim 7 or claim 8, characterized by the fact that the first heat exchanger circuit (36a) is for receiving a secondary heat exchange gas containing nitrogen in an installation for producing electricity by using a high temperature nuclear reactor, and the second heat exchange circuit is the primary circuit (36b) of the high temperature nuclear reactor cooled by a gas such as helium.